

HARVARD UNIVERSITY
DEPARTMENT OF STATISTICS



Tel. 617-495-5496
Fax. 617-496-8057
statdept@stat.harvard.edu
<http://www.stat.harvard.edu/>

Science Center 7th Fl.
One Oxford Street
Cambridge, MA 02138

STATISTICS COLLOQUIUM

MONDAY, SEPTEMBER 28, 2015
TALK: 4:15 PM — SCIENCE CENTER 300H
RECEPTION: 3:50 PM

“High-dimensional Robust Regression”

[Po-Ling Loh](#)
Statistics Department
The Wharton School
University of Pennsylvania

ABSTRACT

We present results for high-dimensional linear regression using robust M-estimators with a regularization term. We show that when the derivative of the loss function is bounded, our estimators are robust with respect to heavy-tailed noise distributions and outliers in the response variables, with the usual order of $k \log p/n$ rates for high-dimensional statistical estimation. Our results continue a line of recent work concerning local optima of nonconvex M-estimators with possibly nonconvex penalties, where we adapt the theory to settings where the loss function only satisfies a form of restricted strong convexity within a local neighborhood. We also discuss second-order results concerning the asymptotic normality of our estimators, and provide a two-step M-estimation algorithm for obtaining statistically efficient solutions within the local region.